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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/675,140

09/30/2003

Anish Goel

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CHOATE, HALL & STEWART LLP
TWO INTERNATIONAL PLACE
BOSTON, MA 02110

EXAMINER

MCCRACKEN, DANIEL

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

07/21/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@choate.com

Office Action Summary	Application No. 10/675,140	Applicant(s) GOEL ET AL.	
	Examiner DANIEL C. MCCracken	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 and 14-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-13 and 41-58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/11/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Citation to the Specification will be in the following format: (S. # : ¶/L) where # denotes the page number and ¶/L denotes the paragraph number or line number. Citation to patent literature will be in the form (Inventor # : LL) where # is the column number and LL is the line number. Citation to the pre-grant publication literature will be in the following format (Inventor # : ¶) where # denotes the page number and ¶ denotes the paragraph number.

Response to Arguments, Remarks

Applicant's arguments with respect to claims 10-13 have been considered but are moot in view of the new ground(s) of rejection. Applicants have *now* amended their claims to recite additional features *not present* in the claims as filed. The claims define the invention. 35 U.S.C. §112, ¶2. As the prior rejections were tailored to address a different invention, all rejections are mooted by Applicants amendment. As such, all rejections are WITHDRAWN. New rejections appear forthwith.

For clarity, in light of Applicants' prior incorrect status identifiers, Claims 10-13 and new Claims 41-58 are pending. Claims 1-9 and 14-40 are withdrawn. Applicants amendment of Claim 11 to include *non-elected* species is noted. Applicants have elected C₆₀. *See* Response to Restriction dated 11/10/2005. In the event allowable subject matter is indicated, these species will be cancelled by Examiner's amendment.

The Examiner *does not* consider the Request for Information resolved. *See* Non-final Office Action of 10/11/2007, p. 3. Applicants should address what was "known, used, on sale, patented, etc." (i.e. all of the 35 U.S.C. §102 activities). This *should not* be burdensome, as the

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article that gave rise to this inquiry was authored by Applicants themselves. Failure to do so in subsequent responses will result said responses being held “non-responsive.” Further, Applicants’ counsel has referred to a “John Howard” in the remarks. *See* Remarks of 4/11/2008, p. 9. No “John Howard” is listed as an inventor. The Oath lists “Jack B. Howard.” Prior US patents list “Jack B. Howard.” *See e.g.* US 5,985,232. Applicants are requested to verify that the inventorship of this application is indeed correct as listed on the Oath filed 1/7/2005. Note that “nicknames” are not proper for oaths/declarations. *See* 37 C.F.R. §1.63(a)(2). Thus, if “Jack” is really a “John,” the Oath is improper. The Examiner reserves the right to object to the oath in subsequent prosecution in light of Applicants response.

Finally, Applicants have cited to paragraphs in the specification. *See* Remarks of 4/11/2008 at 11. Applicants specification as filed contains no paragraph numbering. If Applicants are referring to paragraphs in the pre-grant publication (US 2005/0095191), this should be made explicit in subsequent communication, in the event prosecution proceeds.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

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was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants are now claiming fullerenes versus the previously claimed “fullerenic structure.” Those portions of the Specification relied upon for support for the amendments describe “fullerenic structures.” Stated differently, Applicants disclose structures that appear “fullerenic,” but are not conclusively “fullerenes.” *See e.g.* “Fig 2.” Applicants admit as much. *See* (S. 4:4 – 5:1) (“The hand-drawn black line in the inset to Figure 2 shows the boundary between the area that was analyzed and the particle interior, *whose thickness presents too many stacked carbon layers to allow for accurate structural identification.*”) (emphasis added). Thus, Applicants themselves have stated *on and for the record* that it was unclear what was actually being observed. Furthermore, whatever method was used to arrive at the newly presented “300 molecules per square micron” limitation, it is apparently based on assumptions. *See e.g.* (S. 6: 2) (“Considering the relative amounts of carbon black and functionalized fullerenes utilized, and *assuming a uniform distribution* of fullerenes over the superficial surface of the carbon black, the calculated area concentration of fullerene molecules would be 0.25 molecules/nm².”). How reasonable is this assumption, especially in light of the admitted difficulty in identifying fullerenes in the first place? How do Applicants go from observations along a perimeter to an arbitrary concentration (molecules/micron²)? Where does the number 300 come from? Why was this number chosen? These remarks, while directed at Claim 10, are equally applicable to other claims reciting concentrations.

MPEP 714.02 states that “Applicant should also specifically point out the support for any amendments made to the disclosure.” While Applicants have made a blanket statement to

paragraphs that allegedly support this amendment, no mention of 300 fullerenes/micron² was found, nor was the methodology to arrive at this number detailed. Until these issues are satisfactorily resolved, any subsequent response will be held “non-responsive.”

The remarks and analysis as set forth in the Non-final Office Action of 10/11/2007 as they pertain to the “chemical bond” issue are equally relevant/applicable here, and are expressly incorporated herein by reference.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. While the Examiner recognizes the enablement analysis is cast in terms of whether undue experimentation is necessary to practice the claimed invention and said analysis is accomplished by examining a number of factors related to the breadth of the claims, guidance presented, working examples, etc. – *see In re Wands*, 858 F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988) – the essence of the rejection comes down to the language of the statute, which requires a description of how “*to make and use* [the invention].” 35 U.S.C. §112, ¶1 (emphasis added). Of course, the claims define the invention. 35 U.S.C. §112, ¶2. Applicants claim an arbitrary concentration based on observations that may or may not be accurate. The fact an experiment is recited is irrelevant if the experiment does not enable the claims. Arguments traversing this rejection should detail how 301 molecules of C₆₀ can be deposited on one square micron of carbon black, and how the

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person of ordinary skill in the art would know there are 301 molecules there. Failure to explain this will result in any response being held non-responsive.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The analysis as set forth in the Non-final rejection dated 10/11/2007 is expressly incorporated herein by reference. Whatever distinction Applicants are referring to from the interview (over a year ago) is not of record. Applicants interview summary filed 7/11/2007 does not develop this distinction. The only reason the Examiner made the "C-C bond is a chemical bond" language of record in the interview summary was that Applicants were claiming a fullerene bonded to carbon, which is - needless to say - quite broad. This claim read on hundreds of references, and the Examiner showed restraint in limiting the rejections to those of record. Applicants' addition of a surface area concentration (whatever that is) does not absolve them of their duty to particularly point out and distinctly claim the invention. Until this is resolved, a targeted search is precluded.

Claim Rejections - 35 USC §§ 102-103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. As to the rejection under 35 U.S.C. §§ 102/103, where the applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the Examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. See MPEP 2112 III. (discussing 102/103 rejections).

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 102(b) as being anticipated by Donnet, et al., *Fullerenic carbon in carbon black furnaces*, Carbon 2000; 38: 1879-1902 (hereinafter “Donnet I at ___”).

Fullerenes bound to carbon black particles are seen in Figs. 1-2. (Donnet I at 1886). It is expected that the bonding as claimed, dimensions, density, etc. is taught, given to the similarity in the figures provide. *Compare* (Donnet I at 1886 “Figs. 1-2”) *with* (S. 17-25 “Figs 1-2, 4-6”). This is the evidence offered to show inherency. “[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency’ under 35 U.S.C. 102, on prima facie obviousness’ under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted].” The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). Note that with

respect to 45-46, 54-55, and 57-58, these are product-by-process claims. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). See also MPEP 2113, et seq.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Donnet, et al., *Fullerene carbon in carbon black furnaces*, Carbon 2000; 38: 1879-1902.

The preceding discussion of Donnet accompanying the anticipation rejection *supra* is expressly incorporated herein by reference. See above with respect to 102/103 rejections.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 102(b) as being anticipated by Burden, et al., *In-situ Fullerene Formation – The Evidence Presented*, Carbon 1998; 36(7-8): 1167-1173 (hereinafter “Burden I at ___”).

Burden recites C₆₀ deposited on carbon black. (Burden I at 1168-1169). As Burden recites “nucleation of fullerene molecules on the surface of previously untreated carbon black and graphite particles,” it is expected that the claimed bonding occurs. “[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the

characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). It appears that the claimed dimensions are taught. See above with respect to product-by-process claims.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Burden, et al., *In-situ Fullerene Formation – The Evidence Presented*, Carbon 1998; 36(7-8): 1167-1173.

The preceding discussion of Burden I accompanying the anticipation rejection *supra* is expressly incorporated herein by reference. See above with respect to 102/103 rejections.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 102(b) as being anticipated by Burden, et al., *In-situ Fullerene Formation – The Evidence Presented* [online] American Carbon Society [http://acs.omnibooksonline.com/papers/1997_ii376.pdf]¹ (hereinafter "Burden II at ____).

Burden recites fullerene molecules nucleated on carbon black. (Burden II at 377 "Fig. 1"). Burden's recitation of "fullerenes nucleat[ing] from conventional, intact graphene fragments" suggests chemical bonding in the manner claimed. "[T]he PTO can require an

applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted].” The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). It appears that the claimed dimensions are taught. See above with respect to product-by-process claims.

Claims 10-13 and 41-58 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Burden, et al., *In-situ Fullerene Formation – The Evidence Presented* [online] American Carbon Society [http://acs.omnibooksonline.com/papers/1997_ii376.pdf]²(hereinafter “Burden II at ____).

The preceding discussion of Burden II accompanying the anticipation rejection *supra* is expressly incorporated herein by reference. See above with respect to 102/103 rejections.

Claims 10-11, 13, 41-50 and 56-58 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,851,503 to Mitani, et al.

¹ The American Carbon Society website lists a 1997 publication date, as seen on the url for the pdf file. As such, this reference is being treated as 102(b) art.

² The American Carbon Society website lists a 1997 publication date, as seen on the url for the pdf file. As such, this reference is being treated as 102(b) art.

Mitani teaches fullerene clusters that polymerize. *See* (Mitani 2: 20 *et seq.*). C₆₀ and similar fullerenes are recited. (Mitani 3: 65 *et seq.*). All other features appear to be taught or reasonably suggested. “[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency’ under 35 U.S.C. 102, on prima facie obviousness’ under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted].” The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). See above with respect to product-by-process claims.

Claims 10-11, 13, 41-50 and 56-58 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 5,851,503 to Mitani, et al..

The preceding discussion of Mitani accompanying the anticipation rejection is expressly incorporated herein by reference. See above with respect to 102/103 rejections.

Conclusion

All references of record are considered relevant to Applicants disclosure. Many issues remain unresolved: (1) what Applicants mean by a chemical bond, (2) what was known of the invention before filing – as indicated in Applicants own journal article, (3) what applicants had

possession of when filing, etc. Failure to address these, as noted in the office action, will result in any subsequent remarks being held non-responsive.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

All amendments made in response to this Office Action must be accompanied by a pinpoint citation to the Specification (i.e. page and paragraph or line number) to indicate where Applicants are drawing their support.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL C. MCCracken whose telephone number is (571)272-6537. The examiner can normally be reached on Monday through Friday, 9 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel C. McCracken/
Daniel C. McCracken
Examiner, Art Unit 1793
DCM

/Stuart Hendrickson/
Stuart L. Hendrickson
Primary Examiner